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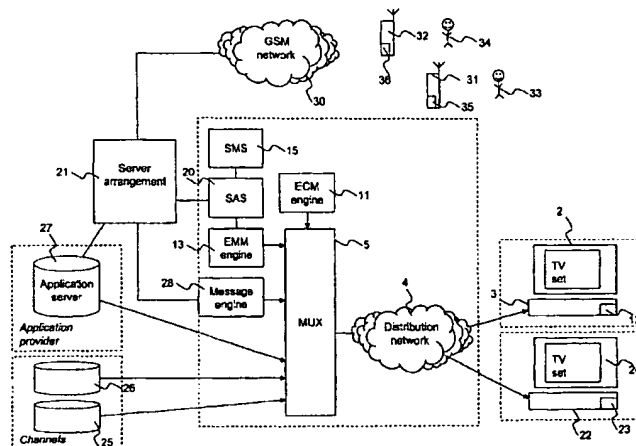
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(54) Title: METHOD AND ARRANGEMENT IN A BROADCASTING SYSTEM FOR HANDLING TV-SERVICES ORDERED THROUGH A MOBILE COMMUNICATION NETWORK



(57) Abstract: Method and system for handling services in a system comprising a TV-system including at least one stationary terminal (3, 22), a mobile communication system (30; 42) including at least one mobile terminal (31, 32; 41), and a server arrangement (21) arranged to communicate with the TV-system and the mobile communication system (30; 42). At a service request regarding a service to be delivered to an arbitrary stationary terminal (3, 22) in the TV-system, and initiated from a mobile terminal (31, 32; 41) in the mobile communication system (30; 42), which service request includes the identity of the stationary terminal (3, 22) and is sent via the mobile communication system (30; 42) to the server arrangement (21), the means for identifying a mobile terminal user in the mobile communication system (30; 42) is used to identify a system user. The invention also concerns a server arrangement (21).

Method and arrangement in a broadcasting system for handling TV-services ordered through a mobile communication network

Technical field

The present invention relates to TV systems and mobile
5 communication systems, and in particular to a method for handling services in a system as described in the preamble of claim 1.

The present invention further relates to a system for handling services as described in the preamble of claim 13.

10 The present invention also relates to a server arrangement for use in a system as described in the preamble of claim 14.

Background of the invention

Today, there are different kinds of systems for offering distributed services to users. One such kind of system are
15 systems with a conditional access, e.g. pay-TV systems, where a user may obtain various services on request, e.g. view a pay-per-view movie or get access to a TV channel.

In a pay-TV system the user is equipped with a decoder that is connected between a TV tap and a TV set at the user's
20 premises. A main part in the system transmits encoded and uncoded signals that the decoder receives via the TV tap. The encoded and uncoded signals may represent encoded and uncoded TV programmes/channels, and the decoder may then decode parts or all of the encoded signals depending on access rights of
25 the user, and thereby access rights of the decoder, i.e. which channels/programmes the user pays to get access to.

Recent systems are often digital, i.e. the system broadcasts digital signals that are decoded by a digital decoder. The

advantage with digital systems vis-à-vis analogue systems is that a considerably larger quantity of data may be transmitted, and by that a considerably larger number of TV channels. The larger capacity in the digital systems also
5 allows space for other services, for example interactive services such as games and surfing the Internet, where a user via a return channel in the system may influence and interact with what is shown on the TV set.

An example of a pay-TV system is described in the German
10 patent application DE 4424380A1. DE 4424380A1 describes a system where a user may order e.g. pay-per-view services via his mobile telephone. The user orders the service by giving a suitable code via the mobile telephone to a server. The server then transmits decoding information to a decoder at the user's
15 premises and the desired service is obtained. The user is identified via the mobile network and is debited e.g. once a month. Other data may as well be transmitted via the mobile telephone, e.g. the user may play an interactive game where the commands are sent via the mobile telephone. The object of
20 the system is to facilitate ordering of services for a user. Instead of making a phone call to one of the pay-TV supplier's operators when he/she wishes to utilise a service, the user may make the order via the mobile telephone instead. In DE 4424380 A1 it is presumed that the user is associated with a
25 certain decoder in the server and that the server in that way knows which decoder the decoding information shall be sent to when a user gives an order.

Another example of a pay-TV system is described in the Swedish patent SE 509 582 C2, which describes a system where a user as
30 in the above described system may order for example pay-per-view services via his mobile telephone. In one embodiment the

user orders the service by giving a suitable code via the mobile telephone to a server. The user is identified via the mobile network. The system is aimed at using a mobile communication network as a return channel and particularly the
5 problem of increasing capacity for the interactive return channel so that other types of services may be ordered by a mobile user. A user is associated with a certain decoder in the system.

Common for the above pay-TV systems is thus that they are
10 designed with an architecture that maintains a 1:1 relationship between a user and a decoder, i.e. the user is associated with a certain decoder in the system and any service orders made by him is automatically delivered to the decoder that is associated with the user.

15 EP 1 030 272 A2 discloses a system for handling and performing electronic payments with electronic assets such as cash cards in inter alia a pay-TV system where the 1:1 relationship between a user and a service supplier is broken. The system consists of a stationary terminal, e.g. a decoder or a PC, a
20 mobile terminal and a server communicating via a communication network. Ordered services may be a pay-per-view programme. The decoder may be at home, at a friend's premises or in a hotel. The decoder has a return channel to the system and a link to the mobile terminal via IR or radio. An order to an optional
25 decoder may be made from the mobile terminal. In EP 1 030 272 A2, however, special decoders and mobile terminals constituting part of the debiting system are required. It is further required that the user is registered in the debiting system with username and password..

A problem with the current systems is that it is not possible to achieve flexibility for the user via existent infrastructure.

Summary of the invention

5 The object with the present invention is to provide a method for handling services in a system including a TV system and a mobile communication system that solves the above problem.

This object is achieved with a method as set forth in the characterising portion of claim 1.

10 Another object with the present invention is to provide a system for handling services, which system admits a solution of the above problem. This object is achieved with the system according to the characterising portion of claim 13.

15 A further object with the present invention is to provide a server arrangement, for use in a system for handling services, as set forth in the characterising portion of claim 14.

An advantage with the present invention is that at a service request regarding a service to be delivered to an arbitrary stationary terminal in the TV system, initiated from a mobile
20 terminal in the mobile communication system, which service request includes the identity of the stationary terminal and is sent via the mobile communication system to the server arrangement, the means for identifying a mobile terminal user in the mobile communication system is used to identify a
25 system user.

Another advantage with the present invention is that the 1:1 relationship between a user and a service provider is broken and the user is given the possibility to use his subscription

more freely by creating a temporary connection between the user's mobile telephone and an optional decoder, while at the same time existing infrastructure in the system is maintained.

Another advantage with the present invention is that a user
5 may be at many different geographical positions, as in a hotel room or at somebody else's premises and still get access to various pay-TV channels, pay-per-view programmes, games, voting information, betting information and shopping information via his subscription, irrespective of who the
10 owner of the decoder is.

Another advantage with the present invention is that in connection with an order of a service or delivery of a service, a debit data post that may be used in an arbitrary debiting system is established, e.g. by any of the means for
15 debiting in the mobile communication system or a cash card system.

Another advantage with the present invention is that a plurality of orders from a user may be stored in a data post together with the identity of the user in order to be debited
20 at certain time intervals, e.g. each month or at a certain achieved amount.

Another advantage with the present invention is that it opens a parallel path to create authorisations, particularly temporary ones, in an existing pay-TV system.

25 Another advantage with the present invention is that it uses existing infrastructure and is applicable to all kinds of mobile communication systems and TV systems.

Another advantage with an embodiment of the invention is that it makes verification of that the mobile terminal and/or

someone with a connection to the mobile terminal is present at the stationary terminal possible.

Brief description of the drawings

The invention will now be described more in detail by means of
5 embodiments and with reference to the attached drawings, in which:

Fig. 1 shows a conventional pay-TV system for use in accordance with the present invention.

Fig. 2 shows a system in accordance with a preferred
10 embodiment of the present invention.

Fig. 3 shows an alternative embodiment of the access part in the system shown in fig. 2.

Fig. 4 shows a signal diagram of the signalling at the establishment of a connection between a mobile terminal and a
15 stationary terminal in accordance with a preferred embodiment of the present invention.

Detailed description of preferred embodiments of the invention

With the word "service" in the description is meant e.g. access to TV channels, pay-per-view programmes, games,
20 shopping information, betting information, voting information etc.

With the word "set-top-box (STB)" used in the description is meant a terminal at a user's premises with a built in decoder to decode incoming encrypted signals to a format suitable for
25 display on a TV set.

Fig. 1 shows a conventional pay-TV system 1 that may be used in a preferred embodiment of the invention. The system

comprises a TV set 2 and a set-top-box (STB) 3 connected to the TV set. The set-top-box and the TV set may be located e.g. at the users home, at an acquaintance's premises or at a hotel. Further, the STB and/or the TV set is connected to a
5 distribution network 4, which may consist of a terrestrial TV distribution network, a satellite TV distribution network or a cable-TV network. Today, the distribution network 4 often is a digital network utilising standards developed by DVB (Digital Video Broadcasting) in the data transmission.

10 Further, a multiplexer that combines the information 6, 7, 8, 9, 10 that is to be transmitted via the distribution network 4, and that effects that the information is transmitted is connected to the distribution network. The information 6, 7, 8, 9, 10 constitutes partly of the TV channels and TV
15 programmes 6 that are to be transmitted via the distribution network, partly by radio 7, partly by e.g. games and other information such as betting information 8, and partly by control information 9, 10, which will be described more in detail below.

20 Each supplier of pay-TV services has his own pay-TV system and in order to allow a plurality of pay-TV systems to coexist in the same distribution network a standard called SimulCrypt has been developed to allow control information from several service suppliers to be sent over the same distribution
25 network.

The control information 9 consists of control word messages, ECM messages (Entitlement Control Message), that are generated in an ECM message engine 11. The ECM messages comprise keys to decrypt various transmissions (e.g. TV channels). A security
30 module 12 in the STB 3 reads the ECM messages together with EMM messages to get permission and keys to decrypt the various

transmissions. The safety module 12 may constitute an integrated part of the STB 3 or consist of a separate module that is to be put into the STB 3. The user's identity is stored on an intelligent card that is connected to the safety module 12 via a card reader. The control information 10 consists of messages for entitlement, Entitlement Management Messages (EMM messages) that is used to transfer rights to the STB. The EMM messages are generated by an EMM engine 13 and comprise information about the user's identity and which services the receiver shall decrypt. The safety module 12 in the STB 3 reads the EMM messages to get knowledge of what the STB 3 shall decrypt and make available to the user, and then uses the ECM messages as decryption keys to be able to decrypt the selected services.

The rights a user shall have, i.e. which EMM messages that shall be sent to a user's STB, is controlled by a Subscriber Authorisation System, SAS 14, which is a system that acts on command by a Subscriber Management System, SMS 15. The SMS 15 is a system that handles subscriber information and sends requests for activation of services to the SAS 14, which translates information from the SMS 15 to EMM messages and makes sure that the security module 12 at the user's premises receives correct authorisation so that correct service may be decoded. The SMS is more or less unique for each service supplier and may be arranged such that there is an operator keying in which users that shall have which services.

Common for systems of the kind in fig. 1 is that they are inflexible in the sense that a user is associated with a certain STB 3 in the SMS 15, and that the services the user requests via the SMS automatically will be sent to the STB the

user is associated with. There is thus a 1:1 relationship between the user and a service supplier.

An object with the present invention is to break apart the above mentioned relationship by allowing a user to more freely
5 use his subscription by creating a temporary connection between the user's mobile telephone and an optional STB in the system, and at the same time maintain the existent infrastructure in the system. For example, a user shall be able to visit another STB holder and himself be able to pay
10 for the movie of the night via pay-per-view. Alternatively, the user may use his subscription during a hotel stay and in the same way be able to watch an optional movie or a TV channel.

The invention will now be described more in detail with
15 reference to fig. 2, which shows a system according to a preferred embodiment of the invention. Details that are similar to those in fig 1 maintain the same reference numerals and will not be described more in detail.

As in fig. 1 the system in fig 2 comprises decoders 3, 22 with
20 safety modules 12, 23 and TV sets 2, 24 connected to the decoders. The system further comprises a distribution network 4, a multiplexer 5, an ECM engine 11, an EMM engine 13 a SMS 15 and a SAS 20.

Further, the services that is to be available via the
25 distribution network 4, e.g. various TV channels 25, 26 and other services such as games, betting information etc. 27, is connected to the multiplexer.

Further, a server arrangement 21, separate from the pay-TV
system 1, is connected to the SAS. The server arrangement 21
30 has opening of a parallel path as a task in order to, aided by

the SAS, create EMM messages that gives a temporary authorisation to a certain STB 3, 22 to show e.g. a TV channel independently of who owns the STB 3, 22. The server arrangement 21 further handles debiting of the service that
5 the temporary authorisation has resulted in.

Further, a mobile communication system 30, which in fig. 2 consists of a GSM network, by which a user may communicate via mobile terminals 31, 32, is connected to the server arrangement 21.

10 When a user 33, 34 wishes to order a service he/she contacts the server arrangement 21 via his/her mobile terminal 31, 32. The user is identified via the mobile communication system 30, which in the case of GSM is effected through that a user first identifies himself with a PIN code vis-à-vis his SIM
15 (Subscriber Identity Module) card 35, 36 on activation of his mobile terminal, whereupon the SIM card 35, 36 is identified in the mobile communication system via the IMSI number (International Mobile Subscriber Identity) of the SIM card 35, 36. In this way the mobile communication system knows who the
20 user is and a unique user identity in form of an IMSI number alternatively the users telephone number is sent together with the set-up request to the server arrangement 21, which then uses the information as a basis for identification and debiting.

25 When the user 33, 34 has established contact with the server arrangement 21, the user 33, 34 states a desired service and an identity of the STB the user wishes to get the service delivered to. The server arrangement 21 then sends information to the SAS 20 about the service concerned and
30 which STB that is to get access to the service. The SAS 20 translates the information from the server arrangement 21 into

EMM messages and makes sure that the security module 12 at the user's premises 33, 34 receives a correct authorisation so that the correct service may be decoded. In connection with the service order, or the delivery of the service, the server arrangement establishes a data post for debiting that is stored together with the users ID. The data post may then be used to debit the user via any optional debiting system, e.g. the debiting means in the mobile communication system or as debiting vis-à-vis a pre-payment account that a user may have with the operator of the server arrangement 21. Debiting may also be carried out by invoice or by debiting a credit card of the user. Several orders may be stored in one data post so that debiting may be carried out at certain time intervals or when the cost for the orders have reached a certain amount.

15 The server arrangement 21 further takes care of that the payment is apportioned in a correct manner between the mobile operator, the service provider (e.g. the owner of the TV channel), the owner of the server arrangement 21 and the owner of the pay-TV system.

20 The contact between the mobile terminal 31, 32 and the server means 21 may be established in several ways. For example, the user may dial a certain number via the mobile telephone and then get menus read from which the user then on request may key in the STB identity and select a desired service.

25 One way to simplify the method vis-à-vis the server arrangement 21 is to provide the SIM card of the mobile telephone with applications that generate extra menus in the mobile telephone. The user may then use the extra menus to establish contact with the server arrangement 21 and to order services. In order to get a possibility to put the applications on the SIM card, e.g. the owner of the server

30

arrangement 21 may act as a virtual mobile operator that issues its own SIM cards programmed with desired applications.

Another example on how the connection may be established is shown in fig. 3. In fig. 3 it is shown how a user's mobile
5 terminal 41, provided with a WAP (Wireless Application Protocol) function, is connected to the server arrangement 21 via a GSM network 42, a gateway 43 and an IP network 44. A user that wishes to order a service enters an IP address via a WAP gateway that is administered by the owner of the server
10 arrangement 21 and that is integrated in the server arrangement 21 or is in connection with it. Via the WAP page the user may then via menu choices order a desired service and on request input the identity of the decoder that the user wishes to get the service delivered to, whereupon the server
15 arrangement 21 takes care of the delivery of the service according to the above.

Another way of establishing the connection is via SMS. In this case the user sends a SMS to the server arrangement 21 with the STB identity and a code representing the service that the
20 user wishes to order.

In order to avoid that a user gives a wrong STB identity and to eliminate the risk of illegitimate use by verifying that the mobile terminal and/or anyone with a connection to the mobile terminal is present at the STB, the connection between
25 the mobile terminal and the STB may be established in the following manner, as will be described with reference to fig. 4.

Fig. 4 shows a signalling diagram for signalling between the mobile terminal, the server arrangement 21 and the STB when a
30 connection is established between the mobile terminal and the

server arrangement 21. When the user contacts the server arrangement 21 via his mobile terminal he (she) is identified via the mobile terminal according to the above (arrow 1) and receives a request for the ID number of the STB he is present at by the server arrangement 21 (arrow 2). The user sends the ID of the STB (arrow 3) to the server arrangement 21, which responds by sending a control code to the STB (arrow 4), which is shown to the user, and which the user sends back to the server arrangement 21 (arrow 5) via the mobile terminal in to show that he/she actually is present at that particular STB. The connection is established (arrow 6) and the user is then inquired for the desired service according to the above (arrow 7) and requests the desired service (arrow 8). The server arrangement may then respond with an acknowledgement (arrow 9). As an extra precaution a request for a PIN code to approve debiting of the service may be sent together with the acknowledgement (arrow 9'), whereupon the user responds by sending his PIN code (arrow 10').

Before the user contacts the server arrangement 21, the user may put the STB in a message receiving mode using the remote control of the STB in order to make message displaying possible, as shown with arrow 11 in fig 4.

If the user has contacted the server arrangement 21 via SMS the user also sends the control code and the PIN code, if any, to the server arrangement 21 via SMS. The control code and the PIN code may be sent in the same SMS.

In order to be able to send the control codes from the server arrangement 21 to the STB the server arrangement 21 may be connected to a message generator 28, which is connected to the multiplexer 5, shown in fig. 2. The message generator 28 creates a message that is transmitted via the distribution

network 4. The message is received by every STB that is connected to the distribution network 4, but is only displayed on the TV set that is connected to the particular STB the message is addressed to. Via the message generator 28 the
5 server arrangement may send various kinds of messages to STBs, e.g. the above mentioned control code.

Another way for the server arrangement 21 to send messages to a STB is to send the messages via an application server 27 (shown in fig. 2). The messages is received by a special
10 software client in the STB for subsequent presentation on the TV set.

One way of simplifying the input of STB identities for the user is that the server arrangement 21 for each user has a plurality of STBs stored as favourites or bookmarks. In this
15 way the user, depending on how the connection with the server arrangement 21 has been established, may either choose STB identity from a list where the STB identities are named or state the STB with a name or short number.

The server arrangement does not have to constitute a separate
20 unit in the system, but may also be integrated in the SAS or in the SMS. The exact localisation of the STB may depend on whether it is the same owner of both the server arrangement and the pay-TV system. Where this is the case it may be advantageous that the server arrangement is integrated with
25 either the SAS or the SMS. In this case the interface between the TV system and its surroundings is considered to pass within the subject construction component, e.g. the server arrangement integrated with the SAS.

The mobile communication network consists in the above example
30 of a circuit switched GSM system. The communication may,

however, of course as well be packet switched, and the mobile communication system may consist of an arbitrary mobile communication system, such as GSM, GPRS or UMTS.

5 In the case of packet switched communication the connection in the mobile communication system between the user's assigned IP address and the user's IMSI/telephone number or equivalent is used to identify the user.

Claims

1. Method for handling services in a system including a TV system including at least one stationary terminal (3, 22), a mobile communication system (30; 42) including at least one mobile terminal (31, 32; 41) and means for identification of a mobile terminal (31, 32; 41) vis-à-vis the mobile communication system (30; 42), and a server arrangement (21) arranged to communicate with the TV system and the mobile communication system, **characterised in** that at a service request regarding a service to be delivered to an arbitrary stationary terminal (3, 22) in the TV system, initiated from a mobile terminal (31, 32; 41) in the mobile communication system (30; 42), which service request includes the identity of the stationary terminal (3, 22) and is sent via the mobile communication system (30; 42) to the server arrangement (21), the means for identifying a mobile terminal user in the mobile communication system (30; 42) is used to identify a system user.
2. Method according to claim 1, in which the requested service consist of a request for some sort of data, **characterised in** that the server arrangement (21) initiates transmission of the requested service to the stationary terminal (3, 22).
3. Method according to claim 2, **characterised in** that the requested service constitutes a TV programme, a pay-per-view movie, access to a TV channel, voting information, shopping information, betting information or a game.
4. Method according to any of the claims 1-3, **characterised in** that a debit data post is established in the server

arrangement (21) in connection with the request or delivery of the requested service.

5. Method according to claim 5, **characterised in** that the debit data post can be used in an arbitrary debit system.
- 5 6. Method according to claim 5, **characterised in** that debiting of the requested service is effected through a cash card system, a credit card or invoicing.
- 10 7. Method according to claim 5, where the mobile communication system further includes means for handling debiting, **characterised in** that debiting of the requested service is effected through any of the means for debiting in the mobile communication system (30; 42).
- 15 8. Method according to claim 7, **characterised in** that the requested service is debited on the account of the mobile terminal user in the mobile communication system (30; 42).
- 20 9. Method according to any of the claims 1-8, **characterised in** that a connection is established between the mobile terminal (31, 32; 41) and the stationary terminal (3, 22) by: (i) the identity of the stationary terminal (3, 22) is transmitted to the server (21) via the mobile terminal (31, 32; 41), whereupon (ii) an acknowledgement is transmitted from the server arrangement (21) to the stationary terminal (3, 22), after which (iii) the server arrangement (21) receives an acknowledgement from the mobile terminal (31, 32; 41).
- 25 10. Method according to claim 9, **characterised in** that prior to step (i) a request for an ID number of the stationary terminal (3, 22) is sent from the server arrangement (21)

to the mobile terminal (31, 32; 41), and that the
acknowledgement sent in step (ii) is shown to the user by
way of the stationary terminal (3, 22), whereupon the
server arrangement (21) receives the acknowledgement from
the mobile terminal (31, 32; 41).

11. Method according to any of the claims 1-10,
characterised in that the service request is effected
through SMS or packet switched transmission, e.g. WAP.

12. Method according to any of the claims 1-11,
characterised in that the stationary terminal (3, 22) is
a set-top-box (STB).

13. System for handling services, including a TV system, a
mobile communication system (30; 42) including means for
identification of a mobile terminal (31, 32; 41) vis-à-
vis the mobile communication system (30; 42), and a
server arrangement (21) arranged to communicate with the
TV system and the mobile communication system (30; 42),
characterised in that at a service request regarding a
service to be delivered to an arbitrary stationary
terminal (3, 22) in the TV system, the server arrangement
(21) is arranged to identify a system user by means of
the means for identifying a mobile terminal user in the
mobile communication system (30; 42).

14. Server arrangement (21), for use in a system for
handling services, which system includes a TV system, a
mobile communication system (30; 42) including means for
identification of a mobile terminal (31, 32; 41) vis-à-
vis the mobile communication system (30; 42), and a
server arrangement (21) arranged to communicate with the
TV system and the mobile communication system (30; 42),

characterised in that at a service request regarding a service to be delivered to an arbitrary stationary terminal (3, 22) in the TV system, the server arrangement (21) is arranged to identify a system user by means of the means for identifying a mobile terminal user in the mobile communication system (30; 42).

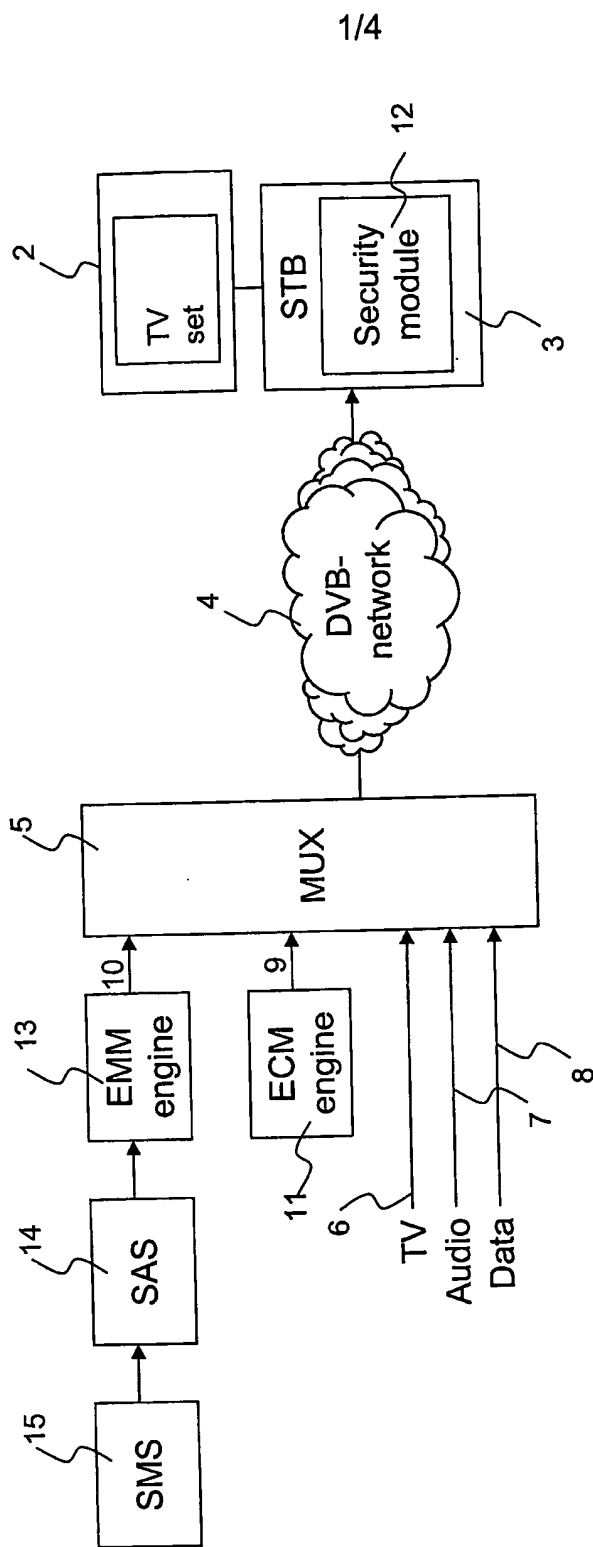
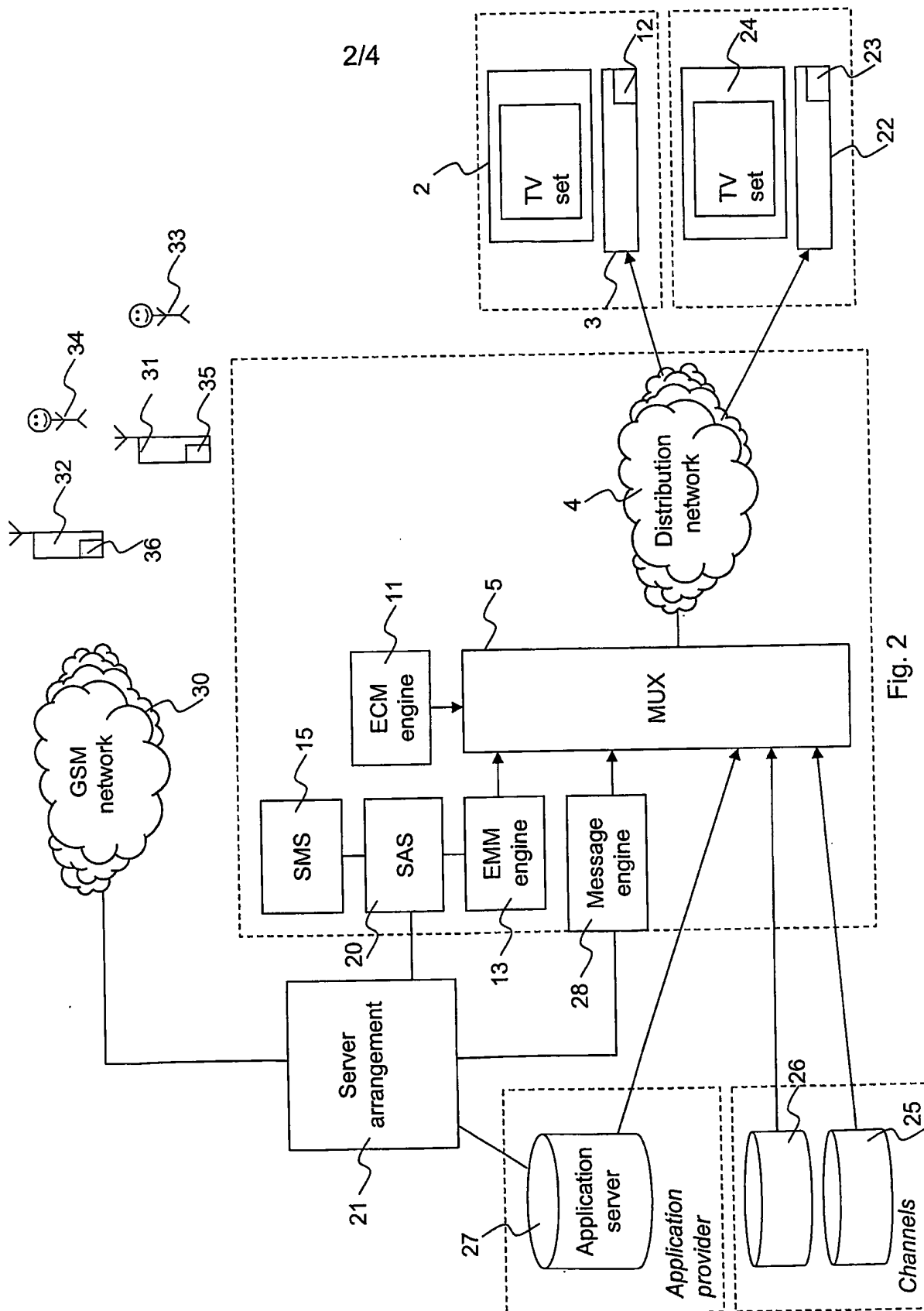


Fig. 1



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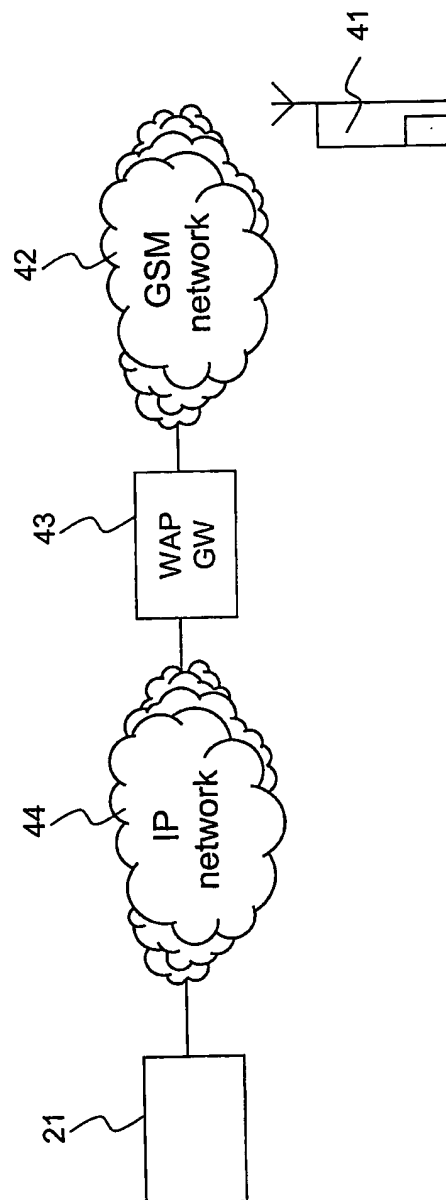


Fig. 3

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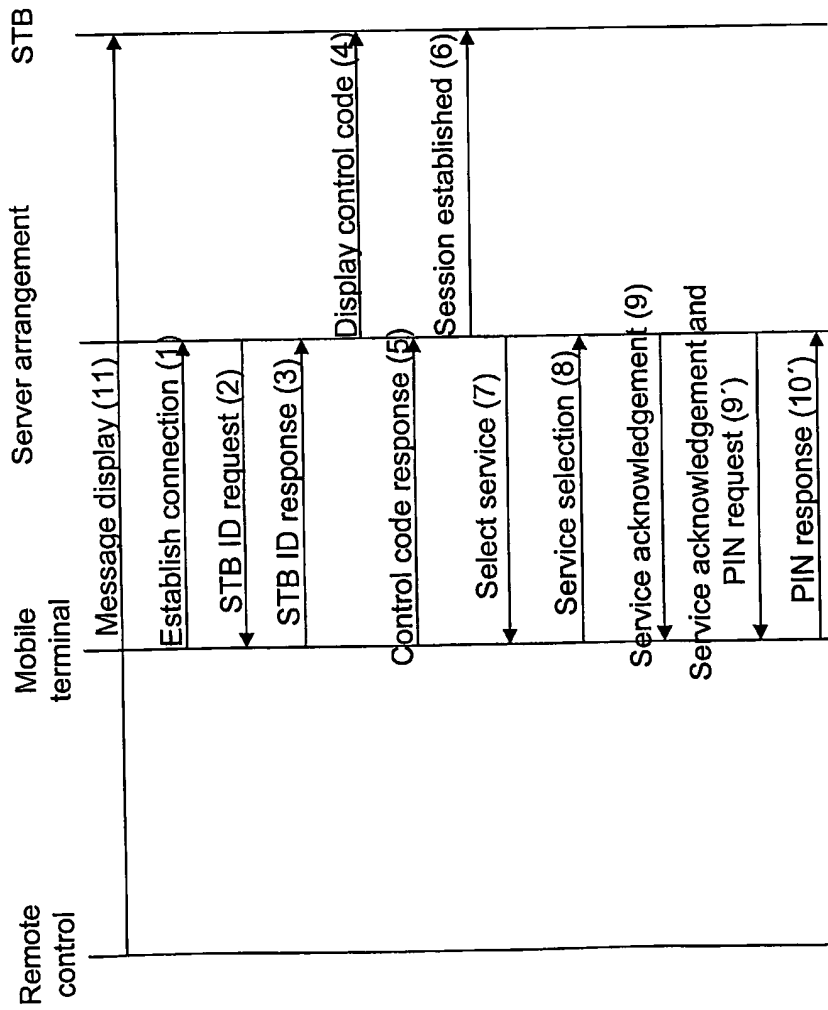


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 02/01933

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04N 7/173

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols).

IPC7: H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ, INSPEC, COMPENDEX, TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 0137567 A1 (NOKIA CORPORATION), 25 May 2001 (25.05.01), page 3, line 23 - page 4, line 9; page 6, line 5 - line 18; page 7, line 4 - line 22, page 8, line 12, - page 10, line 3; figure 2-5; claim 1-9; abstract --	1-14
Y	SE 509582 C2 (TELIA AB), 8 February 1999 (08.02.99), page 5, line 19 - line 38; page 6, line 17 - line 29; page 7, line 10 - line 30, figures 3,5, abstract --	1-14
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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

Date of mailing of the international search report

16 January 2003

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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